U.S. Army Corps of Engineers

Input to the

Report to Congress
and the
Report to the International Joint Commission

on the
Implementation of the Great Lakes Water Quality Agreement

Reporting Period FY 1998-1999

U.S. Army Corps of Engineers
Great Lakes Regional Office
Chicago, Illinois

1. Purpose

This paper provides a description of U.S. Army Corps of Engineers (Corps) activities which contribute to the implementation of the Great Lakes Water Quality Agreement during FY 1998 and FY 1999.

2. Background on Corps of Engineers

2.1 The U.S. Army Corps of Engineers has a number of offices responsible for projects and programs in the Great Lakes Basin. The majority of Corps' civil works program in the Basin is implemented by District offices in Buffalo, Chicago, and Detroit and coordinated by the Great Lakes & Ohio River Division through the Great Lakes Regional Office in Chicago. Other Corps offices with activities in the Basin include the St. Paul District, which manages dredge and fill permits within the States of Wisconsin and Minnesota, and Districts in New York, Omaha and Louisville which support military programs in Great Lakes States. Corps research laboratories at the Waterways Experiment Station in Vicksburg, Mississippi manage a number of environmental research programs with studies conducted at Great Lakes sites. Information and links to all Corps programs and activities in the Great Lakes Basin is available through the Great Lakes Region web site (www.usace.army.mil/lrd/gl.htm).

2.2 The Corps is responsible for a variety of programs or missions that potentially affect Great Lakes water quality. The operation and maintenance of the Great Lakes navigation system is the most recognizable Corps mission in the Great Lakes, and probably has the greatest impact on Great Lakes water quality. In addition, there are a number of individual projects for flood protection, streambank protection and shoreline protection authorized by Congress in varying stages of planning, design, construction, operation and maintenance.

2.3 The Corps of Engineers has a number of programs and authorities for protection, restoration and enhancement of environmental quality. The Corps is the lead Federal agency in the management of the dredged and fill permit program. The Corps is implementing a number of projects in cooperation with State and local partners for habitat restoration, ecosystem management, water quality restoration, environmental dredging, exotic species control, and watershed planning. In addition, the Corps of Engineers provides technical support to the military and other Federal agencies for environmental restoration and enhancement projects.

2.4 This paper will describe Corps projects, studies and activities conducted during the reporting period in relation to specific portions of the Great Lakes Water Quality Agreement. Corps activities contribute to the implementation of Annexes 2 (RAPs & LaMPs), 7 (Dredging), 11 (Surveillance and Monitoring), 13 (Pollution from Non-Point Sources, 14 (Contaminated Sediments), and 17 (Research & Development).

3. Support to the International Joint Commission

3.1 The Corps of Engineers provides technical support to the IJC's water quantity boards which deal with Great Lakes levels and flows: International Lake Superior Board of Control;

International Niagara Board of Control; and, International St. Lawrence River Board of Control. During the reporting period, Brigadier General Hans Van Winkel, Commander of the Great Lakes & Ohio River Division served as the United States Member or Chairman of these control boards and John Kangas of the Great Lakes Regional Office served as the Secretariat of these boards. The Corps also provides technical support to Reference Studies conducted by the IJC. In FY99, Colonel James Hougnon, Deputy Commander of the Great Lakes & Ohio River Division, served as U.S. Chair on the IJC Board for the Consumptive Uses, Diversions and Export of Water Reference.

3.2 The Corps also supports the IJC through participation on water quality Boards and Councils. During the reporting period, Jan Miller of the Great Lakes Regional Office served as a Member of the Council of Great Lakes Research Managers and participated on the Sediment Priority Action Committee established under the Water Quality Board.

4. Remedial Action Plans & Lakewide Management Plans (Annex 2)

4.1 Under the authority of Section 401 of the Water Resources Development Act, the Corps provided technical support to Remedial Action Plans (RAPs) for the following Areas of Concern during FY98 and FY99: Waukegan Harbor (IL), Detroit River (MI), Grand Calumet River (IN), Muskegon Lake (MI) and White Lake (MI). This support included water and sediment quality monitoring, computer modeling, evaluation of alternatives for sediment remediation and habitat restoration, and remedial design.

4.2 The Corps has joined into partnerships with Federal, state and local agencies to develop facilities for the disposal of contaminated sediments dredged from Great Lakes Areas of Concern for navigation and environmental restoration purposes. The Corps is planning and designing multi-purpose confined disposal facilities at the following AOCs: Ashtabula River (OH), Indiana Harbor/Grand Calumet River (IN), and Waukegan Harbor (IL). At the Ashtabula River, the Corps is also completing a feasibility study on the use of a recent environmental dredging authority (Section 312) for the first time. At the Saginaw River and Bay AOC, the Corps' existing confined disposal facility (CDF) will be used for the management of contaminated sediments removed as part of a environmental remediation settlement with industry. At the Detroit River AOC, the Corps if negotiating with the State of Michigan for using the existing Point Mouillee CDF for the management of contaminated sediments to be dredged from the Black Lagoon site.

4.3 Through interagency agreements with the USEPA, the Corps provided technical support to RAPs including the completion of guidance documents on contaminated sediment remediation alternatives. The Corps provided technical support to the USEPA and States for Superfund studies and remediation at a number of AOCs, including St. Lawrence River (NY), Ashtabula River (OH), Manistique Harbor (MI), Sheboygan Harbor (WI), and the St. Louis River (MN/WI). The Corps is also supporting the U.S. Fish & Wildlife Service and State of Michigan with sediment remediation at the Saginaw River resulting from a Natural Resources Damage Assessment settlement with industry.

4.4 The Corps also provided technical support to Lakewide Management Plans with funding from USEPA. This support has involved the development of components for mass balance

models of Lake Michigan.

4.5 The Corps has coordinated with RAP and LaMP committees and working groups, participating on a number of RAP public advisory committees and LaMP technical and management committees, providing information and briefings on Corps data, authorities and funding opportunities.

5. Dredging (Annex 7)

5.1 A summary of navigation dredging conducted by the Corps of Engineers during FY 98 and FY 99 is as follows:

	FY 1998 (actual)	FY 1999 (estimated)
Number of projects	32	36
Volume (cubic yards)	3,254,000	3,742,000

This navigation dredging removed over 4.5 million cubic yards of contaminated sediments from Great Lakes Areas of Concern. Although not conducted for environmental restoration purposes, navigation dredging has contributed to the goals of Remedial Actions Plans at many AOCs.

5.2 In FY 1998, the Corps of Engineers and USEPA finalized the "Great Lakes Dredged Material Testing & Evaluation Manual.". The testing manual is being used for evaluation of dredged material proposed for discharge to the Great Lakes and tributaries by the Corps and applicants for dredge and fill permits. This manual provides regional guidance on dredged material testing using a tiered approach that is consistent with the Criteria and Guidelines developed by the Dredging Subcommittee under the IJC Water Quality Board in 1982. Tests and procedures, including sediment and water column toxicity and bioaccumulation procedures were developed specifically for Great Lakes dredged material. This manual is available online at the following address: (www.epa.gov/glnpo/sediment/gltem/)

5.3 The Corps is a member of the Great Lakes Dredging Team, a partnership of Federal and state agencies established to be an advocate for timely, cost-efficient and environmentally responsible dredging on the Great Lakes. The Team includes members from agencies responsible for natural resources, environmental protection, commerce and transportation. In FY 98 and 99, the Corps supported Team activities which are consistent with the objectives of Annex 7, including efforts to make dredging guidelines and criteria more consistent and provide an exchange of information relating to developments of dredging technology and environmental research. The Dredging Team created a white paper on the decision making process in dredged material management, sponsored a workshop on beneficial use of dredged material and established a web page with information on dredging and dredged material management (www.glc.org/projects/dredging/).

5.4 During FY 98 and 99, the Corps of Engineers, in cooperation with the USEPA conducted demonstrations of technologies for the treatment and recycling of dredged material at confined

disposal facilities (CDFs) in Toledo, Milwaukee, Green Bay and Duluth. The objective is to advance technologies that may allow dredged material in existing CDFs to be reclaimed for beneficial uses offsite. This would prolong the operating life of existing facilities and reduce the need for new CDFs. Technologies being evaluated include composting, oxidation, size fractionation and creating manufactured soils.

5.5 The protection of wetlands is one of the Corps of Engineers most important environmental missions. Under the authority of Section 404 of the Clean Water Act, the Corps administers the regulatory program for the discharge of dredged and fill materials into waters of the U.S., which includes any filling of wetlands. Permits for construction in navigable waters under Section 10 of the River and Harbors Act are also administered by Corps offices. The Corps administers this permit/regulatory program in cooperation with the USEPA who is responsible for most enforcement activities. Permit applications are reviewed in cooperation with Federal and state agencies, public and agency comments reviewed, sampling and testing required of permitees where appropriate, environmental impacts assessed, and mitigation requirements determined. Approximately 10,000 permits are issued by Corps districts within the Great Lakes Basin annually, although the low lake levels are expected to result in an increased number of permit requests in 1999.

5.6 The Corps has authorities under the Water Resources Development Act (Sections 204, 206 and 1135) to work with state and local partners in the protection, restoration and enhancement of aquatic habitat, including wetlands. In FY 98 and 99, the Corps initiated studies on the use of dredged material to restore or create aquatic habitat in Green Bay and Duluth Harbor. The Corps also conducted initial planning for ten lake and wetland restoration projects in the Great Lakes Basin.

6. **Surveillance & Monitoring (Annex 11)**

6.1 The Corps collected water level data at approximately 19 stations throughout the Great Lakes Connecting Channels during FY98 and FY99. In addition, two of the data collection sites on the St. Clair River were used to collect air and water temperature data. This data, along with data collected from several NOAA/NOS gages throughout the Great Lakes, is used to calibrate and run computer models that forecast lake levels and the flow of water throughout the Great Lakes system. The Corps also performed periodic monitoring of the Great Lakes shoreline to identify hazards to navigation and shoreline erosion caused by navigation structures.

6.2 The Corps monitors sediments to be dredged from navigation channels to determine if they are contaminated and evaluate management impacts and options. Testing is conducted in accordance with the Great Lakes Dredged Material Testing & Evaluation Manual, discussed above. The Corps' sediment quality database is used extensively by RAPs and LaMPs. During FY 98 and 99, the Corps collected sediment quality data from approximately 20 Great Lakes harbors.

6.3 The Corps monitors water quality at dredged material disposal operations and confined disposal facilities (CDFs) to assure compliance with water quality standards. CDFs are also monitored for biological activity to protect wildlife that inhabits or visits these facilities.

7. Pollution from Non-Point Sources (Annex 13)

7.1 Under the authority of Section 516(e) of the Water Resources Development Act of 1996, the Corps completed development of sediment transport models for two Great Lakes tributaries (Nemadji River (WI/MN) and Saginaw River (MI)), and started model development at four others (Maumee River (OH/IN), Menomonee River (WI), Buffalo River (NY), and Grand Calumet River (IN). The sediment transport models are intended to aide state and local agencies identify areas responsible for sediment loadings to Great Lakes tributaries and evaluate the impacts of land use modifications. The model developed for the Nemadji River is being used to evaluate the impacts of several forestry practices on sediment loadings and streambank erosion. The Corps is implementing this program in cooperation with the Great Lake Commission, who developed a web site providing information on sediment management and transport modeling (www.glc.org/projects/sediment/).

7.2 The regulatory program under Section 404 of the Clean Water Act, described above, plays an important role in the control of non-point source pollutants through the protection of wetlands. Corps programs to restore and enhance aquatic habitat, also discussed above, also helps control non-point source pollution.

7.3 The Corps, in cooperation with the Natural Resources Conservation Service, completed a study on ways to reduce the erosion of sediments from agricultural lands in the Maumee River watershed which are washed into Toledo Harbor and require dredging every year. The Corps, in cooperation with USEPA is supporting the Indiana Department of Environmental Management development of Total Daily Maximum Loads (TMDLs) for the Grand Calumet River. This effort will identify non point sources of pollution and evaluate ways to reduce these loadings. The Corps, in cooperation with the Metropolitan Water Reclamation District of Greater Chicago completed construction of the first of three reservoirs which will store stormwater and sewage and reduce the backflow of contaminants into Lake Michigan at Chicago during extreme storm events.

7.4 The Corps of Engineers is responsible for the Defense Environmental Restoration Program (DERP) at Formerly Used Defense Sites (FUDS). Under this program, hazardous and toxic wastes, unexploded ordinance, and debris were identified and remediated at several former defense sites in the Great Lakes Basin. In FY98, the Corps assumed responsibility for remediation of radiological contamination at sites used by predecessors of the Department of Energy (the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC)). Under the Formerly Utilized Sites Remedial Action Program (FUSRAP), the Corps characterized contaminated sites, prepared remediation designs and monitored completed sites in the Great Lakes Basin.

8. Contaminated Sediments (Annex 14)

8.1 The majority of Corps of Engineers support to RAPs, discussed above, is focused on the assessment and remediation of contaminated sediments. Corps staff worked on the Sediment Priority Action Committee, under the IJC Water Quality Board, to identify and implement methods to enhance sediment remediation activities at RAPs

9. **Research & Development (Annex 17)**

9.1 The Corps conducts a wide range of research investigations through its laboratories and research centers of relevance to the Great Lakes Water Quality Agreement. These include studies under the following research and technology transfer programs:

Aquatic Plant Control Research Program
Dredging operations & Environmental Research Program
Long Term Effects of Dredging Operations
Water Quality Research Program
Wetlands Research Program
Zebra Mussel Research Program

9.2 The Corps' Waterways Experiment Station (WES) initiated a research investigation of Lake St. Clair, Michigan, in 1998 to examine the effects of submersed aquatic vegetation on hydraulic exchanges and water quality for the western shoreline of Lake St. Clair. The Corps of Engineers Aquatic Plant Control Research Program (APCRP) funded the fiscal year 1998 investigation work. The research is focused on the shoreline area located between the mouth of the Clinton River and the Clinton River Cutoff channel, which has experienced problem beach closing due to poor water quality. Specifically, the investigation was designed to examine water movement and the dispersion of fecal coliform bacteria and nutrients during low, mid and peak aquatic plant biomass periods.

9.3 Innovative technologies for recycling contaminated sediments were demonstrated at confined disposal facilities in Milwaukee and Green Bay with support from the Dredging Operations & Environmental Research Program. The Corps' Water Quality Research Program supported development of a 3-dimensional water quality model applied to the proposed McCook Reservoir in Chicago. Water quality and sediment transport models developed under Corps research programs were applied at several Great Lakes tributaries.